

(PCT Article 36 and Rule 70)

Date of submission of the demand	Date of completion of this report
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/EP2004/008530

## Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language \_\_\_\_\_, which is the language of a translation furnished for the purposes of:
- ☐ international search (Rule 12.3 and 23.1(b))
- ☐ publication of the international application (Rule 12.4)
- ☐ international preliminary examination (Rule 55.2 and/or 55.3)
2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:
- ☐ the international application as originally filed/furnished
- ☒ the description:
- pages 1-28 as originally filed/furnished
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☒ the claims:
- nos. \_\_\_\_\_ as originally filed/furnished
- nos.\* \_\_\_\_\_ as amended (together with any statement) under Article 19
- nos.\* 1-111 received by this Authority on 05.11.2005 with letter of 03.11.2005
- nos.\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☒ the drawings:
- sheets 1/5-5/5 as originally filed/furnished
- sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_
4. ☒ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages \_\_\_\_\_
- ☒ the claims, nos. 39, 72
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

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Box No. IV

Lack of unity of invention

1. ☒ In response to the invitation to restrict or pay additional fees the applicant has:
- ☐ restricted the claims.
  - ☒ paid additional fees.
  - ☐ paid additional fees under protest.
  - ☐ neither restricted the claims nor paid additional fees.
2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is:
- ☐ complied with.
  - ☐ not complied with for the following reasons:

The international application contains a plurality of inventions or groups of invention which are not linked by a single general inventive concept (PCT Rule 13.1), as follows:

- (i) claims 1-38: conveying device for liquid developer;
- (ii) claims 38-71: modular printing device;
- (iii) claims 72-111: electrographic printing device with variable image carrier speed.

4. Consequently, this report has been established in respect of the following parts of the international application:

☒ all parts.

☐ the parts relating to claims Nos. \_\_\_\_\_

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Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement		
1. Statement			
Novelty (N)	Claims	<u>1-111</u>	YES
	Claims		NO
Inventive step (IS)	Claims	<u>1-111</u>	YES
	Claims		NO
Industrial applicability (IA)	Claims	<u>1-111</u>	YES
	Claims		NO
2. Citations and explanations (Rule 70.7)			
<p><b>Observations relating to the first invention (i), claim 1</b></p> <p>Claim 1 defines a conveying device for liquid developer that contains charged toner particles, characterised in that electrical voltage is applied between the engraved roller 202 and the developer roller 203 for the targeted transfer of the toner particles to the developer roller. Metering onto the engraved roller is achieved by means of a chambered doctor blade 201, which is arranged and can be operated such that the liquid developer flows completely around the metering blade (R2).</p> <p>The use of liquid developer leads to problems in metering and regarding the optimum transfer of a sufficient quantity of developer. Bubble-free conveying of the developer from a chambered doctor blade via an engraved roller to a developer roller must, for example, be ensured in order to provide a constantly sufficient quantity of developer fluid. If the liquid developer contains charged</p>			

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	<p>toner particles, as in the present application, conveying and metering is even more difficult.</p> <p>Problems of that type are not known in the prior art in D1 (WO-01/92968 A2).</p> <p>D1 mentions only an engraved roller with a chambered doctor blade, which conveys liquid developer with non-charged toner particles. Document D2 (EP-1 090 756 A1) discloses an adjustable chambered doctor blade for optimum filling of the cups of an engraved roller with ink. It is not, however, certain, whether that doctor blade is suitable for liquid developer with charged toner particles.</p> <p>The subject matter of <b>claim 1</b> is therefore considered novel and inventive in view of the available prior art (<b>PCT Article 33(2) and (3)</b>).</p> <p><b>Observations relating to the second invention (ii), claim 39</b></p> <p>Claim 39 defines a modular printing device that is made up of "independently operable" printing couples. This technical feature can be interpreted to mean that such a printing couple can be used completely <u>independently of the central control unit</u> and of all other printing couples. Such independently or autonomously operable printing couples are <u>not disclosed</u> in the originally submitted description. What are</p>

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	<p>disclosed is simply printing couples each with a printing couple drive for carrying out process control <u>in conjunction with a central control unit</u> (see page 18, line 34 to page 19, line 6 and page 22, lines 23 to 32 of the description).</p> <p>Claim 39 also indicates that the individual printing couples and the feed mechanism for the printing stock are each provided with a drive unit for controlling the printing and conveying operations, said drive units being connected to a central control unit in order to synchronise all operations.</p> <p>Modular printing devices are known from the prior art: D3 (US-A-6219516), D4 (US-A-5258809) and D8 (GB-A-2023503). Those documents disclose printing couples which can be modularly combined to produce a printing system. The printing stock is conveyed by a printing stock feed mechanism that is common to all the printing couples. The known modular printing devices, however, are all controlled by a central drive unit.</p> <p>There is nothing in the available prior art to suggest transferring the driving of the individual printing couples and of the printing stock feed mechanism from the central control unit to the modules and to leave the synchronisation of all operations to the central unit, resulting in greater flexibility when adapting the printing system to different requirements.</p>

Box No. V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

As indicated above, **claim 39** contravenes **PCT Article 19(2)**. It is therefore proposed to delete the feature "independently operable" from line 5 of claim 39. The subject matter of claim 39 is considered novel and inventive in view of the available prior art and meets the requirements of **PCT Article 33(2) and (3)**.

**Observations relating to the third invention  
(iii), claim 72**

Claim 72 contains as a technical feature a "discharging illumination", which can be adapted to the speed of the image carrier element. That technical feature, or a "discharging intensity", is not disclosed in the original application. Page 8, lines 13-15 and 30 and 31 define only charging and illumination intensities which can be appropriately varied. Page 17, line 4 refers only generally to a charging station 112.

Claim 72 defines an electrographic printing device in which the speed of the image carrier can be continuously varied from a bottom speed (0) to a top limit speed, it being possible to adapt the illumination intensity and to keep the supply of toner to the image carrier element at a surface constant. These technical features thus interact so as to achieve a consistent print quality in as large a print speed range as possible.

Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
	<p>Document D9 (US-A-4411514), however, discloses only that the speed of the image carrier can be continuously adjusted according to the chosen rate of increase and that charging, developer voltage and the illumination of the image carrier are altered in line with the set speed. There is nothing in D9 to indicate that the supply of toner to the image carrier element is kept at a surface constant, as is necessary, in particular, in the high-speed range.</p> <p><b>Claim 72</b> contravenes <b>PCT Article 19(2)</b>, since, as already mentioned, "discharging illumination" or an equivalent feature was not originally disclosed. This technical feature should therefore be deleted. The subject matter of claim 72 is considered novel and inventive in view of the available prior art and meets the requirements of <b>PCT Article 33(2) and (3)</b>.</p> <p><b>Further observations on the claims</b></p> <p>Since claims 2-28 are dependent on claim 1, claims 40-71 on claim 39 and claims 73-111 on claim 72, the subject matter thereof is automatically novel and inventive (PCT Article 33(2) and (3)).</p> <p>The subject matter of claims 1-111 is industrially applicable (PCT Article 33(4)).</p>



## Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

The application contains the following defects relating to clarity and support by the description (PCT Article 6):

- **claims 12-14** appear to be superfluous, since they define both synchronous and asynchronous directions of movement. There are no other possibilities;
- **claims 25 and 100** define inlet apertures. Are these also suitable for the discharge of the liquid developer?
- in **claims 47 and 80** an attempt is made to define the subject matter (printing device) in terms of the result to be achieved (toner deposition independent of the speed), without specifying the technical features needed for that purpose;
- what should be understood by electrically adjustable in **claim 48**? What is adjusted is undefined;
- since the originally submitted **claims 69 and 73** have been deleted, claims 70-111 should be re-numbered;
- **claim 72** defines a bottom image carrier speed of 0. It is not clear whether at this speed image generation and printing is at all possible. By what technical means is the speed of the image carrier varied? The claim should therefore also define the means which

## Box No. VIII Certain observations on the international application

make it possible to continuously vary the speed of the image carrier. This would appear to be essential for a person skilled in the art to be able to implement the invention;

- **claim 74:** by what means is the electronic character generation adapted?  
**claims 78 and 79** define a device in terms of a method feature, that is in terms of coupling by way of control processes and in terms of a "principle", and not in terms of technical features;  
**claim 86:** by what technical means is the movability of the toner particles in the developer gap influenced?

**Concluding observations**

Should the applicant wish to pursue the application in the regional phase (EP), then the following points should be addressed at that stage:

- on page 1, lines 31 and 32 of the description, the wording "are part of the disclosure of the present application" should be deleted;
- the description should possibly be restricted in view of the objections specified in Box IV with regard to unity of invention;
- the lack of clarity in the claims should be remedied;

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**Box No. VIII** Certain observations on the international application

- prior art documents D1-D4 and D8 and D9,  
listed in the search report, should be  
mentioned and briefly discussed in the  
description;
- any independent claim should preferably be  
drafted in the two-part form in relation to  
the closest prior art.